

**What is claimed is:**

1. A fabric treatment composition comprising

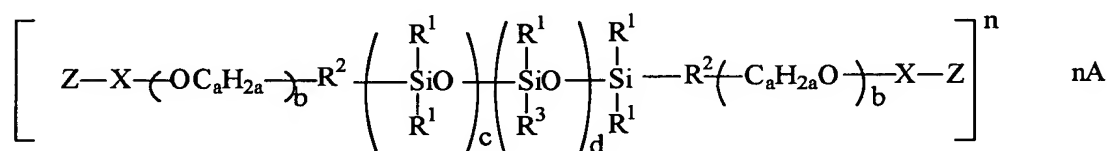
- 5 (a) at least one cationic silicone polymer comprising one or more polysiloxane units and one or more quaternary nitrogen moieties; and  
 (b) one or more nitrogen-free silicone polymers;

wherein the ratio, by weight, of the cationic silicone polymer to the nitrogen-free silicone  
 10 polymer is from about 10:1 to about 0.01:1.

2. A fabric treatment composition according to Claim 1, wherein the ratio, by weight, of the  
 cationic silicone polymer to the nitrogen-free silicone polymer is from about 1:1 to about  
 0.1:1.

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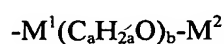
3. A fabric treatment composition according to claim 1 wherein the cationic silicone polymer  
 has the formula:



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wherein:

- R<sup>1</sup> is independently selected from the group consisting of C<sub>1-22</sub> alkyl, C<sub>2-22</sub> alkenyl, C<sub>6-22</sub> alkylaryl, aryl, cycloalkyl, and mixtures thereof;
- R<sup>2</sup> is independently selected from the group consisting of divalent organic moieties;
- 25 - X is independently selected from the group consisting of ring-opened epoxides;
- R<sup>3</sup> is independently selected from polyether groups having the formula:



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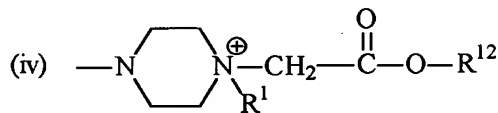
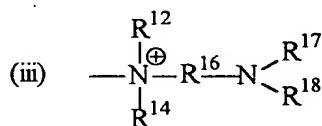
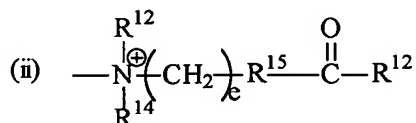
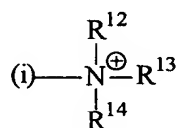
wherein M<sup>1</sup> is a divalent hydrocarbon residue; M<sup>2</sup> is independently selected from the group

consisting of H, C<sub>1-22</sub> alkyl, C<sub>2-22</sub> alkenyl, C<sub>6-22</sub> alkylaryl, aryl, cycloalkyl, C<sub>1-22</sub> hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof;

- Z is independently selected from the group consisting of monovalent organic moieties comprising at least one quaternized nitrogen atom;

5 - a is from about 2 to about 4; b is from 0 to about 100; c is from about 1 to about 1000; d is from 0 to about 100; n is the number of positive charges associated with the cationic silicone polymer, which is greater than or equal to about 2; and A is a monovalent anion.

4. A fabric treatment composition according to claim 3 wherein Z is independently selected  
10 from the group consisting of:



(v) monovalent aromatic or aliphatic heterocyclic group, substituted or unsubstituted, containing at least one quaternized nitrogen atom;

wherein:

- R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup> are the same or different, and are selected from the group consisting of C<sub>1-22</sub>  
15 alkyl, C<sub>2-22</sub> alkenyl, C<sub>6-22</sub> alkylaryl, aryl, cycloalkyl, C<sub>1-22</sub> hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof;

- R<sup>15</sup> is -O- or NR<sup>19</sup>;

- R<sup>16</sup> is a divalent hydrocarbon residue;

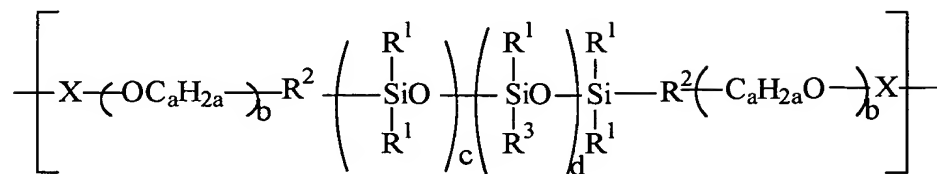
- R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup> are the same or different, and are selected from the group consisting of H,  
20 C<sub>1-22</sub> alkyl, C<sub>2-22</sub> alkenyl, C<sub>6-22</sub> alkylaryl, aryl, cycloalkyl, C<sub>1-22</sub> hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof; and

- e is from about 1 to about 6.

5. A fabric treatment composition according to claim 1 wherein the cationic silicone polymer

is composed of alternating units of:

(i) a polysiloxane of the following formula:



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; and

(ii) a divalent organic moiety comprising at least two quaternized nitrogen atoms;

wherein:

- $R^1$  is independently selected from the group consisting of  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl, and mixtures thereof;
- $R^2$  is independently selected from the group consisting of divalent organic moieties;
- $X$  is independently selected from the group consisting of ring-opened epoxides;
- $R^3$  is independently selected from polyether groups having the formula:

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wherein  $M^1$  is a divalent hydrocarbon residue;  $M^2$  is independently selected from the group consisting of H,  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof;

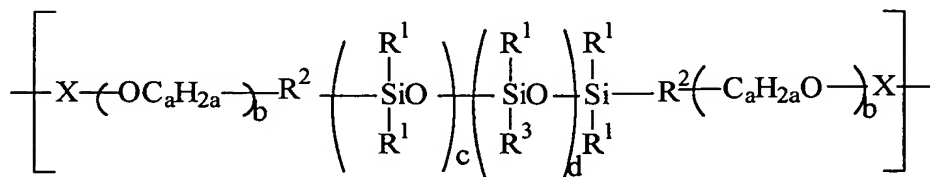
- a is from about 2 to about 4; b is from 0 to about 100; c is from about 1 to about 1000; and d is from 0 to about 100.

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6. A fabric treatment composition according to claim 1 wherein the cationic silicone polymer is composed of alternating units of:

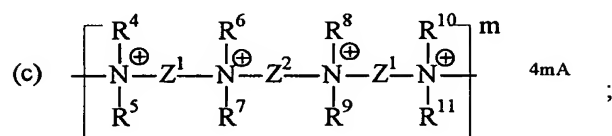
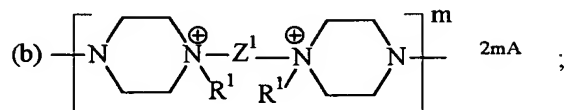
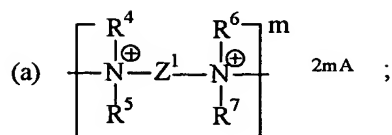
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(i) a polysiloxane of the following formula:



; and

(ii) a cationic divalent organic moiety selected from the group consisting of:



(d) a divalent aromatic or aliphatic heterocyclic group, substituted or unsubstituted, containing at least one quaternized nitrogen atom; and

5 mixtures thereof;

wherein  $R^1$  is independently selected from the group consisting of  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl, and mixtures thereof;

-  $R^2$  is independently selected from the group consisting of divalent organic moieties;

- X is independently selected from the group consisting of ring-opened epoxides;

10 -  $R^3$  is independently selected from polyether groups having the formula:



15 wherein  $M^1$  is a divalent hydrocarbon residue;  $M^2$  is independently selected from the group consisting of H,  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof;

-  $R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}$  are the same or different, and are selected from the group consisting of  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl and mixtures thereof; or in which  $R^4$  and  $R^6$ , or  $R^5$  and  $R^7$ , or  $R^8$  and  $R^{10}$ , or  $R^9$  and  $R^{11}$  are components of a bridging alkylene group;

20 -  $Z^1$  and  $Z^2$  are the same or different divalent hydrocarbon groups each comprising at least about 2 carbon atoms;

- a is from about 2 to about 4; b is from 0 to about 100; c is from about 1 to about 1000; d is from 0 to about 100;

- m is the number of positive charges associated with the cationic divalent organic moiety, which is greater than or equal to about 2; A is an anion; and

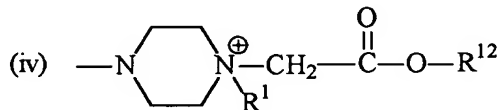
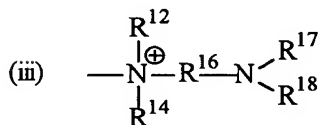
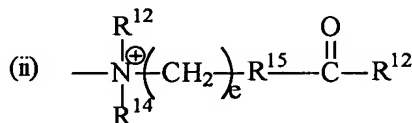
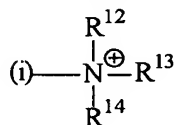
5 wherein, expressed as fractions on the total moles of the organosilicone – free moieties, and the cationic divalent organic moiety (ii) is present at of from about 0.05 to about 1.0 mole fraction.

7. A fabric treatment composition according to claim 6 wherein the cationic silicone further  
10 comprises a polyalkyleneoxide amine of formula:



15 wherein Y is a divalent organic group comprising a secondary or tertiary amine; a is from about 2 to about 4 and b is from 0 to about 100; and the polyalkyleneoxide amine is present of from 0.0 to about 0.95 mole fraction.

8. A fabric treatment composition according to claim 6 wherein the cationic silicone further  
20 comprises an end-group cationic monovalent organic moiety selected from the group consisting of:



(v) monovalent aromatic or aliphatic heterocyclic group, substituted or unsubstituted, containing at least one quaternized nitrogen atom;

wherein:

-  $R^{12}$ ,  $R^{13}$ ,  $R^{14}$  are the same or different, and are selected from the group consisting of  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy

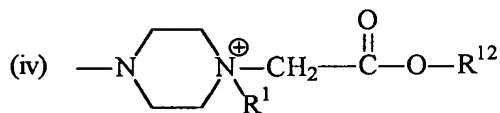
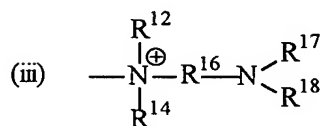
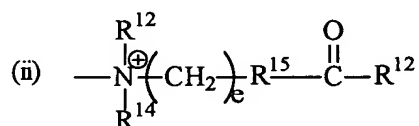
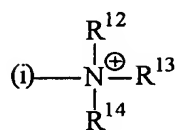
alkyl groups, and mixtures thereof;

-  $R^{15}$  is -O- or  $NR^{19}$ ;

-  $R^{16}$  is divalent hydrocarbon residue;

-  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$  are the same or different, and are selected from the group consisting of H,  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof; e is from about 1 to about 6; and the cationic monovalent organic moiety is present of from 0 to about 0.2 mole fraction.

9. A fabric treatment composition according to claim 7 wherein the cationic silicone further comprises an end-group cationic monovalent organic moiety selected from the group consisting of:



- (v) monovalent aromatic or aliphatic heterocyclic group, substituted or unsubstituted, containing at least one quaternized nitrogen atom;

wherein:

-  $R^{12}$ ,  $R^{13}$ ,  $R^{14}$  are the same or different, and are selected from the group consisting of  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl groups, and mixtures thereof;

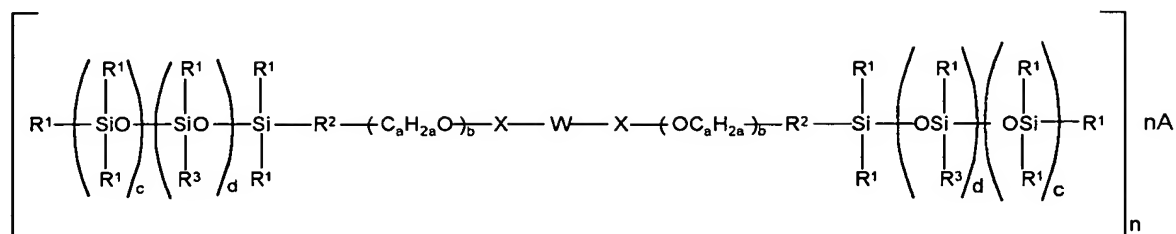
-  $R^{15}$  is -O- or  $NR^{19}$ ;

-  $R^{16}$  is divalent hydrocarbon residue;

-  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$  are the same or different, and are selected from the group consisting of H,  $C_{1-22}$  alkyl,  $C_{2-22}$  alkenyl,  $C_{6-22}$  alkylaryl, aryl, cycloalkyl,  $C_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof; e is from about 1 to about 6; and the cationic monovalent organic moiety is present of from 0 to about 0.2 mole fraction.

10. A fabric treatment composition according to claim 1 wherein the cationic silicone polymer

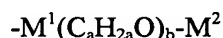
has the formula:



wherein:

- 5 - R<sup>1</sup> is independently selected from the group consisting of C<sub>1-22</sub> alkyl, C<sub>2-22</sub> alkenyl, C<sub>6-22</sub> alkylaryl, aryl, cycloalkyl, and mixtures thereof;
- R<sup>2</sup> is independently selected from the group consisting of divalent organic moieties;
- X is independently selected from the group consisting of ring-opened epoxides;
- R<sup>3</sup> is independently selected from polyether groups having the formula:

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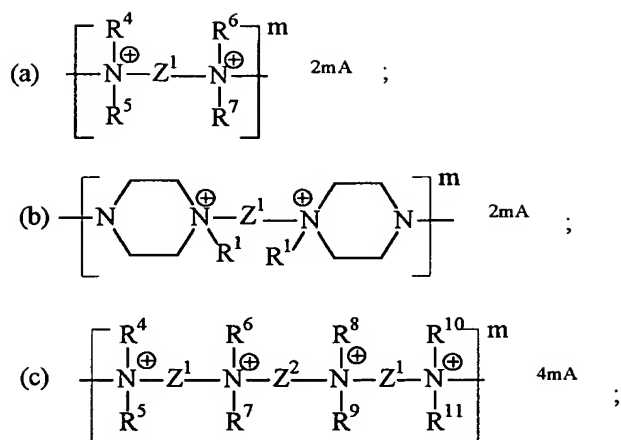
wherein M<sup>1</sup> is a divalent hydrocarbon residue; M<sup>2</sup> is selected from the group consisting of H, C<sub>1-22</sub> alkyl, C<sub>2-22</sub> alkenyl, C<sub>6-22</sub> alkylaryl, aryl, cycloalkyl, C<sub>1-22</sub> hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof;

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- W is independently selected from the group consisting of divalent organic moieties comprising at least one quaternized nitrogen atom;
- a is from about 2 to about 4; b is from 0 to about 100; c is from about 1 to about 1000; d is from 0 to about 100; n is the number of positive charges associated with the cationic silicone polymer, which is greater than or equal to about 1; and A is a counterion.

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11. A fabric treatment composition according to claim 10 wherein W is selected from the group consisting of:



(d) a divalent aromatic or aliphatic heterocyclic group, substituted or unsubstituted, containing at least one quaternized nitrogen atom; and

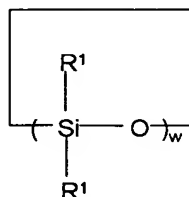
mixtures thereof;

wherein  $\text{R}^4, \text{R}^5, \text{R}^6, \text{R}^7, \text{R}^8, \text{R}^9, \text{R}^{10}, \text{R}^{11}$  are the same or different, and are selected from the group consisting of  $\text{C}_{1-22}$  alkyl,  $\text{C}_{2-22}$  alkenyl,  $\text{C}_{6-22}$  alkylaryl, aryl, cycloalkyl,  $\text{C}_{1-22}$  hydroxyalkyl, polyalkyleneoxide, (poly)alkoxy alkyl, and mixtures thereof; or in which  $\text{R}^4$  and  $\text{R}^6$ , or  $\text{R}^5$  and  $\text{R}^7$ , or  $\text{R}^8$  and  $\text{R}^{10}$ , or  $\text{R}^9$  and  $\text{R}^{11}$  are components of a bridging alkylene group;

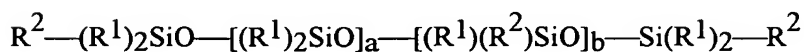
-  $m$  is the number of positive charges associated with the cationic divalent organic moiety, which is greater than or equal to about 2;  $\text{A}$  is an anion; and

-  $\text{Z}^1$  and  $\text{Z}^2$  are the same or different divalent hydrocarbon groups comprising each at least about 2 carbon atoms.

12. A fabric treatment composition according to Claim 1 wherein the nitrogen-free silicone polymer is selected from nonionic nitrogen-free silicone polymers having a formulae selected from (I) to (III):

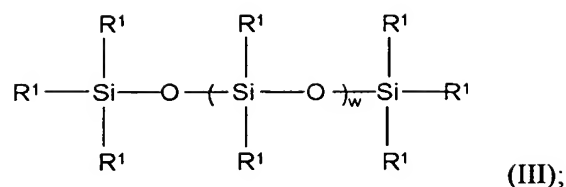


(I);



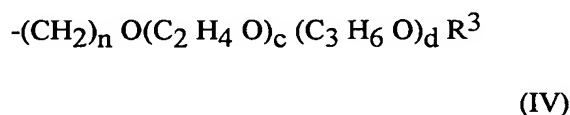


(II);



and mixtures thereof,

wherein each  $\text{R}^1$  is independently selected from the group consisting of linear, branched or cyclic alkyl groups having from about 1 to about 20 carbon atoms; linear, branched or cyclic alkenyl groups having from about 2 to about 20 carbon atoms; aryl groups having from about 6 to about 20 carbon atoms; alkylaryl groups having from about 7 to about 20 carbon atoms; arylalkyl and arylalkenyl groups having from about 7 to about 20 carbon atoms, and mixtures thereof; each  $\text{R}^2$  is independently selected from the group consisting of linear, branched or cyclic alkyl groups having from about 1 to about 20 carbon atoms; linear, branched or cyclic alkenyl groups having from about 2 to about 20 carbon atoms; aryl groups having from about 6 to about 20 carbon atoms; alkylaryl groups having from about 7 to about 20 carbon atoms; arylalkyl; arylalkenyl groups having from 7 to 20 carbon atoms and from a poly(ethyleneoxide/propyleneoxide) copolymer group having the general formula (IV):



wherein at least one  $\text{R}^2$  is a poly(ethyleneoxy/propyleneoxy) copolymer group, and each  $\text{R}^3$  is independently selected from the group consisting of hydrogen, alkyl groups having about 1 to about 4 carbon atoms, acetyl groups, and mixtures thereof, wherein the index  $w$  has the value as such that the viscosity of the nitrogen-free silicone polymer of formulae (I) and (III) is between about  $2 \cdot 10^{-6} \text{ m}^2/\text{s}$  (about 2 centistokes at 20 °C) and about  $50 \text{ m}^2/\text{s}$  (about 50,000,000 centistokes at 20 °C); wherein  $a$  is from about 1 to about 50;  $b$  is from about 1 to about 50;  $n$  is from about 1 to about 50; total  $c$  (for all polyalkyleneoxy side groups) has a value of from about 1 to about 100; total  $d$  is from 0 to about 14; total  $c+d$  has a value of from about 5 to about 150.

13. A fabric treatment composition according Claim 1, further comprising one or more laundry

adjunct materials selected from the group consisting of:

- (a) stabilizers;
  - (b) surfactants selected from the group consisting of nitrogen-free nonionic surfactants, nitrogen-containing surfactants and anionic surfactants, and mixtures thereof;
  - 5 (c) coupling agents;
  - (d) detergent builders;
  - (e) fabric substantive perfumes;
  - (f) scavenger agents selected from the group consisting of fixing agents for anionic dyes, complexing agents for anionic surfactants, clay soil control agents, and mixtures
  - 10 thereof;
  - (g) enzymes;
  - (h) chelating agents;
  - (i) solvent systems;
  - (j) effervescent systems; and
  - 15 (k) mixtures thereof.
14. Use of a fabric treatment composition according to Claim 1 wherein the composition is a rinse-added fabric softening composition or a fabric finishing composition or a laundry detergent composition, and combinations thereof.
- 20 15. Use of a fabric treatment composition according to Claim 1 to impart on a fabric substrate at least one or more fabric care benefits selected from the group consisting of reduction of wrinkles benefits; removal of wrinkles benefits; prevention of wrinkles benefits; fabric softness benefits; fabric feel benefits; garment shape retention benefits; garment shape
- 25 recovery benefits; elasticity benefits; ease of ironing benefits; perfume benefits; color care benefits; and mixtures thereof.
16. A method for treating a substrate comprising contacting the substrate with a fabric treatment composition according to Claim 1.
- 30 17. A process for preparing a fabric treatment composition according to Claim 10 comprising the step of a) premixing the nitrogen-free silicone polymer with the cationic silicone polymer; b) premixing all other ingredients; and c) combining said two premixes a) and b).
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